

Serial No.: 10/015,049
Amdt. Dated: April 20, 2004
Reply to Office action of January 21, 2004.

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REMARKS

In the Office Action of January 21, 2004, claims 1 – 98 were rejected. In this response, originally filed claims 1, 34, 36, 40, 45, 50, 63, 83, 85, 89, and 94 have been amended to recite compositions which do not contain an organic phosphorous-containing derivative and in which the boron source is present in an amount corresponding to between about 0.2 and about 5 or between about 0.2 and about 2 weight percent of the composition; claims 10, 30–33, 43–44, 48–49, 58, 79–82, 92–93 and 97–98 have been cancelled. Claim 63 has been amended to correct an improper and inadvertent dependency kindly pointed out by the Examiner. Applicants submit that especially as amended claims 1-9, 11-29, 34-42, 45-47, 50-57, 59-78, 83-91, and 94-96 recite patentable subject matter and should be promptly allowed. Claims 1-9, 11-29, 34-42, 45-47, 50-57, 59-78, 83-91, and 94-96 remain pending in this application. In accordance with 37 CFR 1.121 (f) no new matter has been added.

In the Office Action of January 21, 2004 claims 1 – 26, 29 – 37, 39 – 41, 43, 45 – 46, 48 – 76, 78 – 86, 88 – 90, 92, 94 – 95 and 97 were rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al. (EP 520,186B1); and claims 1 – 98 were also rejected under 35 U.S.C. 103(a) as being unpatentable in light of the same Watanabe et al. reference (EP 520,186B1).

35 U.S.C. § 102 (b) Rejections

The rejection of claims 1-9, 11-26, 29, 34-37, 39-41, 45-46, 50-57, 59-76, 78, 83-86, 88-90, and 94-95 under 35 U.S.C. 102(b) as being anticipated by Watanabe et al. (EP 520,186B1) is respectfully traversed. The Applicants respectfully submit that the Watanabe reference (EP 520,186B1) does not disclose each and every limitation of their claims and that therefore a rejection under 35 U.S.C. 102(b) is improper.

Applicant's broadest claim, amended claim 1, recites a flame retardant resinous composition comprising: (1) at least one aromatic polycarbonate; (2) at least one silicone source; (3) at least one boron source wherein said boron source is present in an amount corresponding to between about 0.2 and about 5 weight percent of the entire composition;

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and (4) optionally at least one member selected from the group consisting of an antidrip agent, a second thermoplastic resin which is not a polycarbonate resin and a rubber modified graft copolymer wherein the flame retardant composition does not contain an organic phosphorous-containing flame retardant additive. Each of the other of the Applicants' claims are limited to at least the same extent as claim 1. The Applicants' application provides ample antecedent basis for the limitations in claim 1 that the compositions of the claimed invention (i) comprise a boron source limited to an "amount corresponding to between about 0.2 and about 5 weight percent of the entire composition" and (ii) not contain an organic phosphorous-containing flame retardant additive. The limitation that amount of the boron source be between about 0.2 and about 5 weight percent is found in paragraph 44 of the application. Further limitations of the amount of the boron source present is found in originally filed claims 34, 36, 40, 45, 50, 63, 83, 85, 89, and 94; and in the embodiments of the invention provided in the experimental section. The limitation that the compositions "not contain an organic phosphorous-containing flame retardant additive" is based upon the experimental data provided in the application, and further on paragraph 1 of the application in which the Applicants discuss undesirable effects of "phosphate flame retardants" which

"negatively affect the physical properties of the blends, for example by lowering the heat resistance properties."

Applicants' experimental Examples show the negative effects on physical properties of the organic phosphorous-containing flame retardant additives resorcinol diphosphate (RDP) and bisphenol A diphosphate (BPADP). Thus, Table 1 of the application provides illustrations of flame retardant polycarbonate compositions falling outside the scope of the currently claimed invention in which each of compositions CEx.1 and 1-6 contains about 5.88 percent by weight of the organic phosphorous-containing flame retardant additive resorcinol diphosphate (RDP). The flame retardant polycarbonate compositions presented in Table 1 comprise about 70 weight percent BPA polycarbonate and about 12.5 weight percent ABS, in addition to the flame retardant additives present. While the performance of several of these materials in the flammability test is quite good, the glass transition temperature (T_g) of the polycarbonate phase of the composition is significantly lower than that observed for BPA polycarbonate (~145°C) making the materials unsuitable for many applications requiring higher resistance to heat.

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TABLE 1

Ex.	Additive (wt %)	No. of Drips per total number of test parts	FOT1 (avg. seconds)	FOT2 (avg. seconds)	Char Yield (wt %; N ₂ /air)	Tg (°C)
CEx.1	---	10/10	0.9	---	15.1 / 0	118.5
1	PC-siloxane (0.5)	3/10	44.2	---	---	---
2	Boric acid (0.38)	2/10	2.4	24.7	---	---
3	PC-siloxane (0.5) boric acid (0.38)	0/5	2.0	> 60	---	---
4	PC-siloxane (2.5)	0/10	9.9	50	15.5 / 0.9	118.8
5	Boric acid (1.92)	8/9	4.6	63.8	16.3 / 4	---
6	PC-siloxane (2.5) boric acid (1.92)	0/10	2.5	28.8	18.9 / 3.3	120.9

Table 2 of the Application presents data for flame retardant polycarbonate-SAN blend compositions of the present invention (the compositions of Examples 9 and 12). Examples 9 and 12 demonstrate that excellent flammability characteristics may be achieved without a significant reduction in the glass transition temperature of the polycarbonate phase, as is observed in related flame retardant polycarbonate compositions which comprise an organic phosphorous-containing flame retardant additive.

Table 3 presents data for flame retardant polycarbonate-ABS blend compositions each of which falls outside the scope of the claimed invention (as amended) and each of which comprises the organic phosphorous-containing flame retardant additive, bisphenol A diphosphate (BPADP). As can be seen from the data, compositions CEx.13, 16 and 18 have significantly reduced glass transition temperatures, and hence lower resistance to deformation at high temperature, relative to compositions in which the Tg of the polycarbonate phase is higher, such as in the corresponding compositions which do not contain an organic phosphorous-containing flame retardant additive.

Additional data on compositions falling within the scope of the amended claims are presented elsewhere in the Experimental Section of the application.

In contrast to the compositions of the present invention, the flame retardant resin compositions disclosed by EP 520,186B1 comprise an organic phosphorous-containing

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flame retardant additive. See for Example EP 520,186 B1 (page 4, lines 3-14) which provides a list of organo-phosphorous compounds. As amended, the claims of the instant invention do not include compositions comprising organo-phosphorous compounds. Furthermore EP 520,186B1 teaches away from the instant invention in that that the flame retardant resin compositions taught in EP 520,186B1 require the presence of the organo-phosphorous compound (page 2 line 52):

"The flame-retardant resin composition of the present invention contains a phosphorous compound and a zinc borate as essential components, and by the combined use of these two components, an excellent flame retarding effect can be obtained"

Comparative Example 9 (Table 1) of EP 520,186B1 discloses a polycarbonate composition which does not contain an organic phosphorous-containing flame retardant additive, and does contain 10 percent by weight zinc borate and 1 percent by weight polydimethylsiloxane. The composition of Example 9 of EP 520,186B1 does not fall within the scope of the Applicants' claimed invention which limits the amount of boron source to between about 0.2 and about 5 weight percent based on the weight of the composition. Because EP 520,186B1 does not disclose each and every limitation of their claimed invention, the Applicants respectfully request that the rejection of 1-9, 11-26, 29-37, 39-41, 43, 45-46, 48-57, 59-76, 78-86, 88-90, and 94-95 under 35 U.S.C. 102 (b) as being anticipated by Watanabe et al. (EP. Patent No. 520,186) be withdrawn.

35 U.S.C. § 103 (a) Rejections

The rejection of claims 1-98 under 35 U.S.C.103 (a) as being unpatentable over Watanabe et al. (EP. Patent No. 520,186) is respectfully traversed.

Watanabe et al. (EP. Patent No. 520,186) does not produce a flame retardant resin composition free of organic phosphorous-containing flame retardant additives. Instead, Watanabe et al. (EP. Patent No. 520,186) teach that the combination of the organic phosphorous-containing flame retardant additive and the boron compound essential for the flame retarding effect. As noted, the Watanabe (EP. Patent No. 520,186) reference teaches a flame retardant resin composition with good flame retardant properties

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containing the phosphorous compound as shown in the examples cited in the reference (See Examples in Table 1 pages 6-7 of EP 520,186B1).

As noted, the claims of the instant invention do not include compositions comprising organic phosphorous-containing flame retardant additives and that EP 520,186B1 actually teaches away from the instant invention in that that the flame retardant resin compositions taught in EP 520,186B1 require the presence of the organo-phosphorous compound (See page 2 line 52):

"The flame-retardant resin composition of the present invention contains a phosphorous compound and a zinc borate as essential components, and by the combined use of these two components, an excellent flame retarding effect can be obtained"

Moreover, there is no suggestion that in Watanabe et al. that in compositions which are free of an organic phosphorous-containing flame retardant additive the amount of boron source should be limited to an amount corresponding to between about 0.2 and about 5 percent by weight of the overall composition. As noted, Watanabe et al. teach a single composition which is free of organic phosphorous-containing flame retardant additives (See Watanabe Comparative Example 9, Table 1) which teaches an amount of boron source corresponding to 10 percent by weight of the overall composition, twice the amount of boron source present in the Applicants' broadest claim, claim 1. Here again, with respect to limitations on the amount of boron source present in the compositions, Watanabe teaches away from the Applicants' claimed invention.

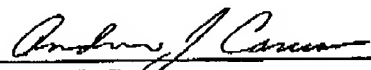
Thus, the Watanabe reference EP 520,186 B1 neither discloses nor suggests the Applicants' claimed invention. Therefore, Applicants respectfully urge that the rejection of claims 1-98 under 35 U.S.C.103 (a) as being unpatentable in view of Watanabe et al. (EP. Patent No. 520,186) be withdrawn.

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In view of the foregoing amendments and arguments made above, the Applicants believe that each of claims 1-9, 11-29, 34-42, 45-47, 50-57, 59-78, 83-91 and 94-96 are now in condition for allowance. The Applicants thus courteously solicit a review of the proposed amendments and prompt allowance of these claims. Should the Examiner believe that anything further is needed to place the application in even better condition for allowance, the Examiner is requested to contact the Applicants' undersigned representative at the telephone number below.

Respectfully submitted,



Andrew J. Caruso
Reg. No. 48,520

General Electric Company
Building K1, Room 3A71
Schenectady, New York 12301
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Telephone: (518) 387-7354

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